इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 9436 (1980): Performance Requirements and Methods of Tests for Wheels for Passenger Cars [TED 7: Automotive Tyres, Tubes and Rims]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

UDC 629·114·5·012·3 : 620·178·3

IS : 9436 - 1980

(Reaffirmed 2006)

Indian Standard

PERFORMANCE REQUIREMENTS AND METHODS OF TESTS FOR WHEELS FOR PASSENGER CARS

1. Scope — Specifies laboratory test methods and performance requirements for evaluating certain essential strength characteristics of wheels intended for use on passenger cars.

1.1 Failure criteria for the tests on wheels has also been specified.

2. General — Only fully processed new wheels which are representative of wheels intended for the vehicle shall be used for the tests. No wheel shall be used for more than one test.

3. Tests — Following two tests are covered:

a) Dynamic cornering fatigue test, and

b) Dynamic radial fatigue test.

3.1 *Dynamic Cornering Fatigue Test*

3.1.1 *Equipment* — The test machine shall have a driven rotatable device whereby either the wheel rotates under the influence of a stationary bending moment or the wheel is stationary and is subjected to a rotating bending moment.

3.1.2 *Procedure*

3.1.2.1 *Preparation* — The rim flange of the wheel shall be clamped securely to the test fixture. The face by which the wheel centre is supported on the testing machine shall have the same fixation characteristics as the face of the hub used on the vehicle. If a tyre and wheel assembly is used as a combination for the test, the tyre pressure shall be higher for clamping purposes. The recommended minimum pressure is 375 kPa. The load arm and adapter assembly shall be attached to the mounting surface of the wheel using non-lubricated studs and nuts (or bolts), in good condition, representative of those used on the vehicle. These wheel nuts (or bolts) shall be tightened at the beginning of the test to the vehicle/wheel manufacturer's specified torque values. Wheel bolts or nuts may be retorqued once during the test. Tightening torque shall not fall below 50 percent of its initial value when the minimum load cycle number has been attained. The bending moment shall be maintained within ±2·5 percent. In the final clamped position, the wheel shall be concentric to the rotating device within 0·25 mm *Max* (TIR) at the point of loading in the unloaded condition.

3.1.2.2 *Bending moment* — To impart a bending moment to the wheel, a force may be applied either perpendicular or parallel to the plane of the mounting surface of the wheel at a specified distance (moment arm).

3.1.3 *Bending moment determination* — The bending moment M (force × moment arm) in newton metres, is determined from the formula:

$$M = (R \cdot \mu + d)\, F_{v1} \times S$$

where

R = static loaded radius in metres of the largest tyre to be used on the wheel as specified by the vehicle manufacturer;

μ = assumed coefficient of friction developed between tyre and road;

d = inset or outset of the wheel in metres;

F_{v1} = half of the maximum vertical static load in newtons, on the front axle;

S = accelerated test factor.

Note — For values of μ and S, *see* Appendix A.

3.1.4 *Failure criteria*

a) Inability of the wheel to sustain load.

b) A fatigue crack penetrating through a section of the wheel.

c) The wheel shall withstand a minimum of 18 000 load cycles without failure.

Automotive Vehicles Sectional Committee, EDC 38; Tyres, Tubes and Rims Subcommittee, EDC 38 : 8 [Ref : Doc : EDC 38 (3021)]

Adopted 27 February 1980

© September 1980, ISI

[redacted] Gr

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

3.2 *Dynamic Radial Fatigue Test*

3.2.1 *Equipment* — The test machine shall be equipped with a means of imparting a constant radial load only as the wheel rotates. The suggested equipment incorporates a driven rotatable drum set which presents a smooth surface wider than the loaded test tyre section width. The preferred diameter of the drum is 1 700 mm (nominal).

3.2.2 *Procedure* — The tyre selected for this wheel test shall be representative of the maximum size and type specified by the vehicle manufacturer for the wheel. The recommended cold inflation pressure of the test type shall be in accordance with the following values:

Service Pressure kPa	*Test Pressure* kPa
Up to 160	280
161 to 280	450

There will be a slight increase in pressure during the test. This increase is normal and no adjustment is necessary. The loading system shall maintain the specified load within ± 2·5 percent.

3.2.3 *Radial load determination* — The radial load F_r, in newtons, is determined as follows:

$$F_r = F_v \times K$$

The value of radial load F_r to be used is F_{r1} or F_{r2} whichever is greater as determined by the following formulae No. (1) and (2):

$$F_{r1} = F_{v1} \times K_1 \qquad \dots\dots(1)$$

where

F_{v1} = half of the maximum vertical static load in newtons on the front axle, and
K_1 = accelerated test factor;

or

$$F_{r2} = F_{v2} \times K_2 \qquad \dots\dots(2)$$

where

F_{v2} = half of the maximum vertical static load in newtons on the rear axle, and
K_2 = accelerated test factor.

Note — For values of K_1 and K_2, *see* Appendix A.

3.2.4 *Failure criteria*

a) Inability of wheel to sustain load.
b) A fatigue crack penetrating through a section of the wheel.
c) The wheel shall withstand a minimum of 400 000 test cycles without failure.

APPENDIX A

(*Clauses* 3.1.3 *and* 3.2.3)

TEST FACTORS

A-1. To permit a uniform application of the test methods specified, the test factors given in the following table should be used when conducting the tests.

Test	*Accelerated Test Factors*
Dynamic cornering fatigue $\mu = 0·7$ (*see* **3.1.3**)	$S = 1·60$
Dynamic radial fatigue (*see* **3.2.3**)	$K_1 = 2·25$ $K_2 = 2·00$

EXPLANATORY NOTE

This standard is in agreement with the International Standard ISO 3006-1976 'Road vehicles — Passenger car wheels — Test methods ' issued by the International Organization for Standardization. It also includes the performance requirements apart from test methods.

Assistance has also been derived from SAEJ 328a, ' Wheels — Passenger cars — Performance requirements and test methods', issued by the Society of Automotive Engineers (Inc), USA.

Printed at New India Printing Press, Khurja, India